

Assessment 0

Python Challenges

1 Python 1 3 PTS

Complete the function according to its docstring.

PYTHON3.6

```
7
8     Parameters
9     -----
10    string: str
11
12    Returns
13    -----
14    dict
15        A dictionary with counts of each character in string
16
17    '''
18    string = string.lower()
19    letter_list = list(string)
20    d = {}
21    for items in letter_list:
22        if items in d:
23            d[items] +=1
24        else:
25            d[items] = 1
26    return d
27    pass
```

RESET INPUT

RUN TESTS



CODING

▼ HIDE TEST RESULTS

```
•  
-----  
Ran 1 test in 0.000s  
  
OK
```

2 Python 2 3 PTS

Complete the function according to its docstring.

PYTHON3.6

```
11 Returns  
12 -----  
13 dict  
14     A dictionary of sets of input keys indexing the same input values  
15     indexed by the input values.  
16  
17  
18 >>>invert_dictionary({'a': 2, 'b': 4, 'c': 2})  
19 {2: {'a', 'c'}, 4: {'b'}}  
20 ''  
21 values_list = list(d.values())  
22 values_list.sort()  
23 new_d = {}  
24 for i in values_list:  
25     new_d[str(i)] = set()  
26     for keys in d.keys():  
27         if d[keys] == i:  
28             new_d[str(i)].add(keys)  
29 return new_d  
30  
31
```

RESET INPUT

RUN TESTS



saved at 11:46pm PDT

CODING

▶ SHOW TEST RESULTS

Probability Challenge

3 **Probability 1** 3 PTS

Complete the function according to its docstring.

PYTHON3.6

```
1 def cookie_jar(a, b):
2     '''
3     There are two jars of cookies.
4     Each has chocolate and peanut butter cookies.
5     Input 'a' is the fraction of cookies in Jar A which are chocolate.
6     Input 'b' is the fraction of cookies in Jar B which are chocolate.
7     A jar is chosen at random and a cookie is drawn.
8     The cookie is chocolate.
9     Return the probability that the cookie came from Jar A.
10
11     Parameters
12     -----
13     a: float
14         Probability of drawing a chocolate cooking from Jar A
15     b: float
16         Probability of drawing a chocolate cooking from Jar B
17
18     Returns
19     -----
20     float
21         Conditional probability that cookie was drawn from Jar A given
```

RESET INPUT

RUN TESTS



CODING

▼ HIDE TEST RESULTS

```
•
-----
Ran 1 test in 0.000s

OK
```

NumPy Challenge

4 **NumPy 1** 3 PTS

Complete the function according to its docstring.

PYTHON3.6

```
14         Size of matrix to be created
15     scalar: int
16         Value of each element of new matrix
17     matrixA:
18
19     Returns
20     -----
21     NumPy array
22         Result of matrix product of row-by-col matrix of "scalar"'s times
23         matrixA.
24
25     E.g., array_work(2, 3, 5, [[3, 4], [5, 6], [7, 8]])
26         [[3, 4],      [[5, 5, 5],
27         [5, 6],      *  [5, 5, 5]]
28         [7, 8]]
29     '''
30     matrixB = [[scalar for i in range(cols)] for i in range(rows)]
31     A = np.array(matrixA)
32     B = np.array(matrixB)
33     return A.dot(B)
34
```

RESET INPUT

RUN TESTS



saved at 11:47pm PDT

CODING

▼ HIDE TEST RESULTS

```
.
-----
Ran 1 test in 0.000s

OK
```

Pandas Challenge

5 **Pandas 1** 3 PTS

Complete the function according to its docstring.

PYTHON3.6

```
1 def data_frame_work(df, colA, colB, colC):
2     '''
3     Insert a column (colC) into the dataframe that is the sum of
4     colA and colB. Assume that df contains columns colA and colB and
5     that these are numeric.
6
7     Parameters
8     -----
9     df: Pandas DataFrame
10    colA, colB, colC: str, str, str
11    '''
12    df[colC] = df[colA] + df[colB]
13    return df
14
```

RESET INPUT

RUN TESTS



CODING

▼ HIDE TEST RESULTS

```
.
-----
Ran 1 test in 0.002s

OK
```

Math Challenges

6 **Math 1** 3 PTS

Given the following matrix and vector:

$$\mathbf{X} = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix}$$

$$\mathbf{y} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$$

What is the product $\mathbf{X}\mathbf{y}$?

Note: hitting enter will submit the challenge, indicate the separate lines of your matrix by typing \n where the break would be.

14 \n 10



CONCEPTUAL

Probability and Statistics Challenges

7 **Prob/Stats 1** 3 PTS

Consider a sample of data S obtained by flipping a coin x , where 1 denotes the coin turned up heads, and 0 tails.

$$S = \{1, 1, 0, 1, 0\}$$

What is the sample's mean?

0.6



CONCEPTUAL



No Time Limit

9/9 attempted

Save And Exit

Continuing with the data from the previous challenge, what is the probability of observing these data (3 heads) assuming that a coin with an equal probability of heads and tails was used?



CONCEPTUAL

9 **Prob/Stats 3** 3 PTS

A probability distribution

P is dependent on two categorical values

x and

y .

x can take on values T and F, while

y can take on values of a, b, and c. The following joint distribution table

describes the joint probability

$P(x, y)$:

	a	b	c
T	0.2	0.1	0.2
F	0.05	0.15	0.3

What is $P(x=T \mid y=b)$?



CONCEPTUAL